

**AMENDMENTS TO THE CLAIMS**

1. (Currently amended) A bioreactor culture system for mass producing mature conifer somatic embryos, comprising:
  - a closed vessel;
  - a biomass immobilization matrix positioned in the closed vessel, said immobilization matrix having a vertical configuration;
  - a pump enabling an adjustment of a level of a liquid culture medium contained in the closed vessel, the level of liquid culture medium substantially submerging the immobilization matrix in a first initial flooding condition, and the level of liquid culture medium being equal to or lower than a lower end of the immobilization matrix in a subsequent maturation step of the conifer somatic embryos; and
  - a liquid culture medium spraying equipment for spraying liquid culture medium onto the biomass immobilization matrix to thereby irrigate said immobilized biomass during said maturation step.
2. (Original) The culture system of claim 1, further comprising a gas control equipment for controlling the concentration of oxygen in the gas phase of the closed vessel.
- 3-5. (Cancelled)
6. (New) The culture system of claim 1, further comprising a means for periodical nutrient refreshment or replacement.
7. (New) The culture system of claim 2, wherein the gassing is at a controlled flow rate to maximize conifer somatic embryo production.
8. (New) The culture system of claim 1, wherein the closed vessel is equipped with a medium pumping port, a spray nozzle port for medium feeding and recirculation, a gas inlet and a gas outlet.



(b) immobilizing said embryogenic tissues onto a biomass immobilizing matrix contained in said bioreactor, under initial flooding conditions thereof;

(c) reducing the level of said culture medium in said bioreactor to a level such that only a lower end of said matrix, or less, remains immersed in said medium; and

(d) subjecting said attached embryogenic tissues to a maturation step under controlled humidified conditions,

thereby enabling mass production of mature conifer somatic embryos.

19. (New) A process as defined in claim 18, wherein the immobilizing is carried-out while maintaining said matrix immersed in said culture medium, and a mixing of the liquid culture medium and the conifer embryogenic tissues is carried-out under low shear conditions until said embryogenic tissues attach to the immobilizing matrix and form an immobilized biomass.

20. (New) The process of claim 18, wherein said level of medium in (c) is reduced to a level below that of the biomass immobilizing matrix.

21. (New) The process of claim 18, which further comprises:

(a) installing a biomass immobilization matrix in a closed vessel of said bioreactor; and

(b) sterilizing said biomass immobilization matrix and said closed vessel, prior to the inoculating step.

22. (New) The process of claim 18, wherein the maturation step comprises:

(a) maintaining an immobilized, maturing biomass under sterile conditions; and

(b) spraying of a liquid medium over said immobilization matrix.

23. (New) The process of claim 18, further comprising removing most of said culture medium between said immobilizing of said tissues and said maturation step.

24. (New) A process for the mass production of mature conifer somatic embryos in a bioreactor comprising:



